

**The Unseen Conflict: Strategic Technology Competition**  
**Testimony of Mr. Christopher Darby, President and CEO of In-Q-Tel**  
**February 12, 2020**

***Opening***

Good morning Mr. Chairman, Ranking Member, and members of the Committee.

My name is Chris Darby and I manage In-Q-Tel (IQT), a not-for profit strategic investor working on behalf of the U.S. Intelligence Community and the wider U.S. national security community. IQT's business is rooted in understanding the future of technology innovation, how market forces shape that trajectory, how these trends potentially impact U.S. national security, which emerging companies could provide new capabilities to the Community and ultimately how best to engage with those small companies. That said, I offer these remarks in my personal capacity only; I am not speaking for the Intelligence Community, the U.S. government, In-Q-Tel, or for the National Security Commission on Artificial Intelligence.

Thank you for inviting me to discuss the central role that the next generation of technology will play in determining the future of the United States and how our government and private sector might more effectively partner to support the nation.

Historically, great power competition and global influence have often been won and lost based on a country's ability to achieve and project technical dominance. The industrial revolution provided the foundation for Europe's ascendancy, and for the past 50 years the IT revolution has underpinned the projection of America's strength around the world. Names like Intel, IBM, Cisco, Oracle, Dell, Microsoft, Google, and many others emerged from Silicon Valley, Boston, Seattle, and other innovation hubs around the country. These companies quickly grew to dominate the global markets and in doing so projected America's soft power around the world. Every country knew that the United States was the world's leader in high tech and more importantly, they knew that they benefited from U.S. leadership.

It is easy to believe that American tech pre-eminence is guaranteed based on our rich history of innovation supported by our top tier Universities. But I would offer a cautionary note: where is Digital Equipment Corporation today? Where are Nortel, Compaq, and Sun Microsystems today? Where are the mighty "Bell Labs"? The Labs are still around but they are now owned by Nokia. Even tech titans can fall, and our tech leadership position must not be taken for granted.

I submit that over the next 50 years, the ongoing battle for technical supremacy will once again largely determine the winners and losers in great power competition in the world. And more than that, this technology battle will likely determine the norms and values that govern our lives. From where I sit, the United States appears to be at an inflection point. China is beginning to reap the benefits of a long-term strategy focused on leveraging technology to

enable its commercial enterprise, advancing its power and international position without having to resort to military force. The U.S. needs to provide alternatives based on its own technology strategy and commercial enterprise.

Too often at the policy level, in the U.S. we view technology as purely an enabler of military capability. Technology, however, also projects economic power, facilitates societal stability (or instability), and reflects norms and values. Importantly, we must also acknowledge that today it is commercial technology that provides the foundation upon which nations are built. That foundation is comprised of such things as communications networks, computing infrastructure, power grids, as well as healthcare and financial systems.

It is interesting to note that a conversation took place early in Huawei's history between Ren Zhengfei, the Founder, and Party general secretary Jiang Zemin. Twenty-six years ago, in 1994, Ren suggested that:

"(telco) switching equipment technology was related to national security, and that a nation that did not have its own switching equipment was like one that lacked its own military."<sup>1</sup>

This prompts the question, are we today investing in the areas necessary to maintain and position U.S. technical preeminence in the coming decades? I submit that we are making great progress, but that there are holes that need to be filled.

### ***Investment Trends in the U.S.***

Here in the U.S., Venture Capital is a pattern recognition business, identifying opportunities that will, based on the investor's experience, deliver outsized returns. Today, almost every pitch deck has the letters AI in it somewhere, but this isn't instructive in assessing the real level of AI investment taking place in the U.S. The "hot areas" of investment remain things like cloud-based software services, ML-based automation and robotics, open source and "freemium" models, synthetic biology, and almost anything "As A Service." The name of the game is Annual Recurring Revenue.

American venture capitalists (VCs) have perfected a model that has yielded both exquisite technical innovation and above average returns for investors, to the point that U.S. venture capital became that finely tuned pattern recognition business. Unfortunately, to the extent that American venture capitalists invest against known patterns, *it equally means that they are unlikely to invest in areas that do not fit their proven model*. For example, areas generally not targeted for investment by American venture capitalists include universities or lab projects, generally considered too early by VCs, as well as later stage, pre-revenue "hard tech" companies in sectors like semi-conductors, where very high capitalization requirements and risk

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<sup>1</sup> Ahrens, Nathaniel (February 2013). "China's Competitiveness Myth, Reality, and Lessons for the United States and Japan. Case Study: Huawei" [https://csis-prod.s3.amazonaws.com/s3fs-public/legacy\\_files/files/publication/130215\\_competitiveness\\_Huawei\\_casestudy\\_Web.pdf](https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/130215_competitiveness_Huawei_casestudy_Web.pdf)

profiles don't fit the U.S. venture model. *This is where the U.S. Government has an opportunity and, I would argue, an obligation.*

Not solely driven by financial returns, Chinese investors are consciously ignoring the tried and true pattern of successful American investors, instead finding investment opportunities in the U.S. to further the longer-term Chinese security and economic interests, even when not always generating near-term returns for those same investors. To that end, we have seen Chinese interests move both upstream – and in some cases – downstream of American investors. For example, investment firms from China today are actively targeting and funding startups formed at American universities. These are the same startups who leverage \$37 billion of annual university research funding from our federal government.

### ***Technology Strategy***

Both China and Russia have made it very clear that they are investing in the areas they believe will form the basis for the tech revolution over the next 50 years. These areas include AI, but also microelectronics, high performance computing and quantum, 5G, and other “hard tech” investments – and China’s investments in biotech deserve a more fulsome, separate conversation. These strategies are not just “all of Government” but “all of Nation.”

In China, this strategy of civil/military fusion has aided and abetted the rise of Huawei, Tencent, WeChat, Baidu, Alibaba, SenseTime and others. It regards the export of technology by their private sector as a projection of China’s soft power around the world.

Thoughtful technology strategy at the nation state level also contemplates adjacencies and layers. It is easy to see how, for example, building upon a global 5G presence, that commercial dominance in mobile payments becomes an easy, layered next step. Likewise, building upon a 5G presence, things like surveillance services and the integration of “added value” AI capabilities become logical moves. We are seeing this today with the health monitoring being undertaken utilizing the SenseTime video surveillance platform in China. The United States must view foundational technologies and services as building blocks and avoid viewing discrete areas of technology in isolation.

The U.S. can compete and win, but we will need to fill the gaps in U.S. policy and investment, then do what we do best: innovate and deliver.

We must start by asking:

### ***Where are the gaps in U.S. policy and investment?***

The first gap may be *our planning time horizon*. We will need to take a longer term view of our investment strategy beyond the research phase. There is a “*commercialization gap*” that needs to be filled by continuing to invest in, and support, our research and development efforts as they attempt to “Cross the Chasm” to become viable commercial products and services.

Secondly, there are “hard tech” domains that need immediate plans and investment by the U.S. government to provide foundational support which, in turn, will help to syndicate new investment by American private equity interests. These tech domains include:

1. Communications infrastructure
  - a. 5G and 6G Open-RAN “on a chip” support
  - b. Nextgen core switching research
  - c. Commercial space, in areas like launch capacity
2. Microelectronics
  - a. Providing fabrication capacity, as well as
  - b. packaging capability, and increasing our investment in
  - c. disruptive core research on materials and architectures.
3. HPC/Quantum
  - a. Both research, and
  - b. Investment are required.
4. AI
  - a. We must invest to address the Talent deficit, and we must focus on the adjacent, enabling technology,
  - b. See microelectronics
5. Biotech
  - a. Bio is the next revolution and
  - b. genomic data sets provide the foundation for innovation
    - i. what is our National genomic strategy
      1. health, climate, food will all be impacted by our execution in this area.
  - c. Diagnostics? We have a deficit of investment in diagnostics.
  - d. And much more... worthy of a separate conversation.

In the interest of time I will go a little deeper on only the first two areas:

### **5G and 6G**

This is still “winnable.” Disruption in the 5G stack is coming and the U.S. needs to lead that disruption. The 5G/6G land grab is going to go on for the next 10 years, and I believe that there is still time to change the competitive landscape.

American startups began investing in 5G and associated hardware years ago. There are a variety of small companies in the U.S. making cheaper, lighter, smarter, more energy-efficient 5G hardware components to help create a more open, secure and intelligent 5G networks. However, at the 2020 Mobile World Congress only one U.S. company was nominated in the category of best 5G network infrastructure; a company called Parallel Wireless. It is proof that the U.S. can compete.

These small companies working on these hard problems, seeking to disrupt Huawei with new, innovative approaches, often struggle to raise money from traditional investors. I believe that more support from the USG is required if they are going to realize their potential and compete globally.

To that end, I wish to commend Senators Warner, Burr, Rubio, Menendez, Cornyn and Bennet, the bipartisan group of Senators who recently sponsored significant legislation (below) to fill a significant gap in 5G funding. Absent legislation such as this, it is likely that emerging U.S. companies who are attempting to disrupt 5G technology going forward would be forced to take investment from foreign interests including from China.

“The Utilizing Strategic Allied (USA) Telecommunications Act would promote research into new U.S. 5G alternatives by requiring the FCC to set aside \$750 million for a research and development fund. The legislation would also create a \$500 million “Multilateral Telecommunications Security Fund” at the Treasury Department, with the funds available for ten years to help encourage the adoption of “trusted and secure equipment” worldwide.”<sup>2</sup>

Shifting to:

### ***Microelectronics***

Leadership in semiconductor technology is essential to the mission of the U.S. Defense and Intelligence communities. In an era of hypersonics, the speed at which software and algorithms are processed counts. Microelectronics, high performance computing architectures, and potentially quantum technology may mean the difference between winning and losing. Whether powering weapons systems, surveillance platforms, communication networks, or big data analysis, semiconductor performance underpins the success of any mission.

Equally important, microelectronics are essential to the business world as well and semiconductor technology has been a significant area of investment and development since the 1940s. The U.S. has led the way. However, while advances in this industry were funded for a long time by the U.S. Venture Capital industry, that funding has waned in recent years as the IRR (internal rate of return) from semiconductor investments has not been competitive with the IRR generated in other sectors. This funding pressure, combined with the movement of the mature part of the semiconductor industry offshore to China and other parts of Asia, has left the U.S. Government in a precarious situation. The result is that U.S. startups in the microelectronics space, which are largely “fabless,” are forced to go offshore, to TSMC or Samsung, for state of the art merchant fabrication. This situation is not in the U.S. interest and must be remedied.

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<sup>2</sup> “Senators Offer Bill to Create Alternatives to Huawei in 5G Tech” The Hill.com  
<https://thehill.com/policy/cybersecurity/478197-senators-offer-bill-to-create-alternatives-to-huawei-in-5g-tech>

I believe that legislation is needed to target this very serious gap.

### ***In Closing***

Sadly, a few weeks ago we lost one of our great minds in American business, a gentleman named Clay Christensen. Many of you will know him as the author of “The Innovator’s Dilemma” and “Crossing the Chasm.” I don’t think Dr. Christensen would have minded if I now borrow from his work and suggest that what we need is “disruptive innovation” at the Nation State level.

The battlefield for global power over the next 50 years is going to be in the universities, labs, and startups delivering new, innovative technology to the world. Investments in hard tech including microelectronics, quantum computing, and biotechnology must be made, and, at the same time, we need to ensure that our significant national research investments have a path available for commercialization by American interests.

We will also need to start recalibrating the relationship between Government and the Private Sector. A discussion about “our National interest” needs to take place. My experience suggests that the private sector does want to support our Government and the future of this great Country, but that a conversation needs to take place.

There are many questions that remain unanswered. What is our Nation’s Technology Strategy? How do we execute that strategy? To what extent does the strategy require a coordinated, complementary response by our public and private sectors? Not only will the answers to these and related questions, determine America’s place in the world going forward, they could ultimately determine the way we will define, “Life, Liberty, and the Pursuit of Happiness.”

The path forward, however, seems clear. The United States needs three things:

1. **An actionable, long term National Technology Strategy and Implementation Plan** – jointly crafted by Government and the private sector.
  - a. What is needed is a common language and a plan. Startups don’t speak “Government” and Government doesn’t speak “startup,” but the conversation begins with a national technology plan that can be shared and discussed. Then, what is needed are incentives and measurements that align with achieving the technology goals that we lay out for our Nation. Clearly Government will need to adapt, as will the private sector. The status quo, however, will not work.
2. **A corresponding “all of Government” National Technology Investment Plan** that includes:
  - a. Coordinated R&D investments across the USG and its allies,
  - b. Targeted USG investment, at scale, in commercialization initiatives,

- i. where such capital investment is either:
    - 1. not undertaken by American private investors, or
    - 2. necessary to encourage and syndicate American private investment,
  - ii. Such investment will also serve to develop and encourage entrepreneurship in America, and
  - c. Investment must be made in our Nation's Tech Talent.
- 3. Lastly, the USG must immediately invest in what I refer to as **"Enabling infrastructure"**
  - a. Investment in, for example, domestic microelectronics merchant fabrication and packaging capacity, to support our fabless semi companies, or
  - b. Data sets to enable such things as genomic research or machine learning applications.
  - c. These are the foundational elements upon which the next generation of American powerhouse hard tech companies can be built.

As the Subcommittee considers how technology can contribute to the nation's security and how to encourage a closer and more collaborative relationship between government and technology firms, I urge you to think expansively. I believe you can play a crucial role in helping the nation understand the wider, less visible dimensions of geopolitical competition that I have outlined today. We cannot wait another decade to organize a democratically-inspired technology strategy to sustain U.S. global leadership in the 21<sup>st</sup> century.

Thank you.